

Records of Paradoxosomatid Millipedes of India

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ABSTRACT

A review of the family Paradoxosomatidae along with a list of genera and species so far recorded from India has been brought in this short paper.

RÉSUMÉ

Ce travail présente une revue taxinomique de la famille Paradoxosomatidae, accompagnée d'une liste des genres et espèces actuellement répertoriés en Inde.

INTRODUCTION

The family Paradoxosomatidae was first proposed by DADAY (1889) for the two genera of the order Polydesmida, *Trachydesmus* and *Paradoxosoma*. COOK (1895) recognized the family Paradoxosomatidae. In addition, he created a family Strongylosomatidae, a heterogenous group that was later considered synonymous to Paradoxosomatidae (JEEKEL, 1968).

ATTEMS (1898), in his monograph of the order Polydesmida, rejected the name Paradoxosomatidae, but recognized the family Polydesmidae in which he included the sub-family Strongylosominae, which included a number of genera along with *Trachydesmus* and *Paradoxosoma*. Apart from this, he distinguished the sub-family Sulciferinae. Both the sub-families were quite heterogenous as are almost all of the genera that are now included and referred to as Paradoxosomatidae. Subsequently, ATTEMS (1914), in his revised studies, merged these two sub-families into a single family Strongylosomidae. He published his work as a monograph in 1937 "*Das Tierreich*" vol. 68. His work included a description of the genera and species known up to 1937. This book acquired importance among the workers and became the origin for all the subsequent studies on the order. Following this, a number of contributions were made towards the revision, criticism and re-classification of the family Paradoxosomatidae (HOFFMAN, 1953, 1961, 1963, 1964; JEEKEL, 1963 a, b).

HOFFMAN critically evaluated the classification of Ethiopian fauna and briefly reviewed the genera. He also commented on the fauna of East Asia (HOFFMAN, 1961, 1963). JEEKEL (1963) presented a survey of the Paradoxosomatidae of the Neo-tropical regions and his publications dealt with the taxonomy of the Indo-Australian fauna. Further, he set right the anomaly in the classification to a certain extent arranging the so far known genera and species of Paradoxosomatidae according to their zoo-geographic regions (JEEKEL, 1968). He discussed

and evaluated previously proposed classifications, bringing numerous changes in the generic delimitation of the fauna of several regions, including India.

ATTEMS (1937) estimated about 490 species of millipedes of the family Paradoxosomatidae whereas, in 1968, JEEKEL estimated 650 species. However, how many more might have gone unsighted and remained obscure is not known. JEEKEL (1963a) stated that "to the family Paradoxosomatidae are referable all genera included in the monograph on the Strongylosomidae published by ATTEMS, 1937, with the exception of *Aphelidesmus* Brol., *Iulidesmus* Silv., *Antisoma* Chamb., *Fijiodesmus* Chamb., *Phyletodesmus* Chamb., *Semenellogon* Chamb. and *Strongylomorpha* Silv.". In the same paper JEEKEL reinstated the name Paradoxosomatidae which, up to that time was mostly referred as Strongylosomidae or Strongylosomatidae.

According to the present state of our knowledge, the family is the largest of the order Polydesmida, which in turn is the largest order of the class Diplopoda.

The main character used for distinguishing Paradoxosomatidae is the presence of unconnected gonopod coxae, which are not joined by membranous bridge as in the other Polydesmid families. Coupled with this are the other typical features namely the unique presence of a distinct post-femoral cingulum in the gonopods, mode of insertion of the coxal horn in the gonopod coxa and the location of paired setae on the paraprocts.

Owing to the scantiness of the Indian faunistic studies, much remains to be done in the way of revisionary studies of the described species. ATTEMS (1936) was the first to study and describe some of the species belonging to this family under the name Strongylosomidae. Some notes have been furnished concerning *Anoplodesmus* (JEEKEL, 1965), *Chondromorpha* (JEEKEL, 1963a) and *Sundanina* (JEEKEL, 1953), but information on many genera is still lacking. To strengthen the studies, the author has carried out this review work and has planned to conduct a survey and studies on the family Paradoxosomatidae.

JEEKEL (1968) presented the diversity and distribution of oriental fauna and published a consolidated list of the fauna known till then, from which a list of the Indian paradoxosomatids has been brought out here, for the reference of the Indian workers. The list includes millipedes belonging to the four tribes, namely Sulciferini, Xanthodesmini, Sundanini and Polydrepanini. Of the four, the first three belong to the sub-family Paradoxosomatinae and the fourth to Alogolykinae.

CHECK-LIST OF PARADOXOSOMATID MILLIPEDES OF INDIA

List of species recorded by ATTEMS (1937) and reported by JEEKEL (1968)

1. *Orthomorpha* (*Kalorthomorpha*) *coonoorensis* Carl, 1932
2. *O. (K.) ursula* Attems, 1932
3. *O. (K.) dentata* Carl, 1932
4. *O. (K.) almorensis* Turk, 1947
5. *Anoplodesmus tanjoricus* (Pocock, 1892)
6. *A. anthracinus* Pocock, 1895
(Syn. *Jonespeltis splendidus* Verhoeff, 1936)
7. *A. insignis* Attems, 1936
8. *A. saussurii* (Humbert, 1865)
9. *A. indus* (Chamberlin, 1920)
10. *A. atopus* (Chamberlin, 1920)
11. *Chondromorpha severini* Silvestri, 1897
12. *C. severini* var. *robusti* Attems, 1936
13. *C. mammifera* Attems, 1936
14. *C. kelaarti* (Humbert, 1865)
15. *C. kelaarti* sub. sp. *valparaiensis* (Carl, 1932)

16. *C. kelaarti* sub. sp. *longipes* (Verhoeff, 1936)
17. *C. kaimura* Turk, 1947
18. *Paranedyopus subcylindricus* Carl, 1932
19. *Himantogonus rufocinctus* (Carl, 1932) Comb. nov.
20. *Streptogonopus phipsoni* (Pocock, 1892)
(Syn. *Strongylosoma contortipes* (Attems, 1898))
21. *S. nitens* Attems, 1936
22. *S. jerdani* (Pocock, 1892)
23. *Sundanina nulla* Attems, 1936
24. *S. laevisulcata* Carl, 1932
25. *S. hirta* Carl, 1932
26. *S. contortipes* (Schubart, 1935)
27. *S. granulifera* Attems, 1936
28. *S. bimontana* Carl, 1932
29. *S. trifida* Carl, 1941
30. *S. pumila* Attems, 1944
31. *S. septentrionalis* Turk, 1947
32. *Dasypharkis rugulosa* (Carl, 1932)
33. *Polydrepanum tamilum* Carl, 1932
34. *P. implicatum* Carl, 1941
35. *Telodrepanum badaga* Carl, 1932
36. *Grammorhabdus asperrimum* Carl, 1932
37. *Xiphidiogonus spinipleurus* Carl, 1932
38. *X. dravidus* Carl, 1932
39. *X. hendersoni* Carl, 1932
40. *Gyrodrepanum contortipes* (Carl, 1932) Comb. nov.
41. *Kaschmiriosoma contortipes* (Schubart, 1935)

From the above list JEEKEL, in the same work, pointed out that the "*Orthomorpha*" *coonoorensis*, "*O.* *almorensis*", "*O.* *dentata*", "*Polydrepanum*" *implicatum*, "*Sundanina*" *granulifera*, "*S.* *trifida*", "*S.* *hirta*", "*S.* *simplex*" and "*S.* *septentrionalis*" belonged to unnamed genera, and stated that the allocation to definite genera could be done only after a careful study of the pertinent material.

JEEKEL (1980) reexamined some of the Indian species of paradoxosomatids and proposed two new genera, *Parchondromorpha* and *Harpagomorpha* of the tribe Suliciferini for the species *Orthomorpha coonoorensis* (Carl, 1932) and *Orthomorpha dentata* (Carl, 1932) respectively. He erected a nov. gen. for *Sundanina laevisulcata* (Carl, 1932) and *Sundanina hirta* (Carl, 1932): the genus *Antichirogonus*. In the same work, he described the characteristics of the genera *Polydrepanum* Carl, 1932 and *Dasypharkis* Attems, 1936 of the tribe Polydrepanini. He discussed the status of the tribes Polydrepanini and Alogolykini. He also reported *Desmoxytes planata* Pocock from the Andamans.

The following are the Indian paradoxosomatids reported by JEEKEL (1980):

1. *Paranedyopus rufocinctus* (Carl, 1932)
2. *Paranedyopus subcylindricus* (Carl, 1932)
3. *Paranedyopus simplex* (Humbert, 1865) new comb.
4. *Paranedyopus ursula* (Attems, 1936) new comb.
5. *Parchondromorpha coonoorensis* (Carl, 1932)
6. *Harpagomorpha dentata* (Carl, 1932)
7. *Antichirogonus laevisulcatus* (Carl, 1932)
8. *Antichirogonus hirtus* (Carl, 1932)
9. "*Kronopolites*" *unicolor* Attems, 1936
10. "*Kronopolites*" *spiniger* Attems, 1936
11. "*Strongylosoma*" *montigena* Carl, 1935
12. *Dasypharkis* Attems, 1936 (2 sp.)

13. *Gyrodrepanum* Carl, 1932 (1 sp.)
14. *Polydrepanum* Carl, 1932 (2 sp.)
(Syn. *Grammorhabdus* Carl, 1932)
15. *Telodrepanum* Carl, 1932 (1 sp.)
16. *Xiphidiogonus* Carl, 1932 (3 sp.)
17. "*Polydrepanum*" *implicatum* Carl, 1941
18. "*Sundanina*" *granulifera* Attems, 1936
19. "*Sundanina*" *trifida* Carl, 1941
20. *Desmoxytes planata* (Pocock, 1895)
(Syn. *Prionopeltis planatus* Pocock, 1895)

JEEKEL listed the genera that are under inverted commas above, as *incertae sedis* and stated that these required reexamination of the gonopods for proper allocation to their genera.

GOLOVATCH (1984) examined the millipedes collected from India by Dr. G. TOPAL of the Hungarian Natural History Museum, Budapest, in 1967, and discovered some very important specimens of paradoxosomatids. He distinguished 16 species belonging to 13 genera of this family. Among these, 9 were found to be new to science. He erected 8 new genera and synonymised one. His work presented the description and allocation of the new taxa established by him.

The following is the list of paradoxosomatids which Dr. GOLOVATCH listed from the collection of Dr G. TOPAL.

A List of paradoxosomatid millipedes of India (Reported by S. I. GOLOVATCH, 1983, 1984)

1. *Kaschmiriosoma contortipes* Schubart, 1935
2. *Chondromorpha mammifera* Attems, 1936
3. *Kronopeltis occidentalis* Golovatch, 1983
4. *Topalosoma setiferum* sp. nov. Golovatch, 1984
5. *Curiosoma bispinosum* sp. nov. Golovatch, 1984
6. *Polydrepanum horridum* sp. nov. Golovatch, 1984
7. *Hindomorpha* (= *Sundanina*) *granulifera* (Attems, 1936)
8. *Parchondromorpha indica* sp. nov. Golovatch, 1984
9. *Parchondromorpha similis* sp. nov. Golovatch, 1984
10. *Armolites spiniger* (Attems, 1936)
11. *Laterogonopus simplex* sp. nov. Golovatch, 1984
12. *Substrongylosoma distinctum* sp. nov. Golovatch, 1984
13. *Substrongylosoma falcatum* sp. nov. Golovatch, 1984
14. *Himalomorpha montigena* (Carl, 1935)
15. *Paranedyopus cylindricus* comb. nov. (Carl, 1935)
16. *Paranedyopus elongissimus* sp. nov. Golovatch, 1984

The above lists constitute a record of the Indian paradoxosomatid millipedes reported so far.

ACKNOWLEDGEMENTS

The author thanks Dr. C. A. W. JEEKEL, Amsterdam, Netherlands and Dr. S. I. GOLOVATCH of the Institute of Evolutionary Morphology and Ecology of Animals, Russian Academy of Sciences, Moscow, for their help in providing the literature on Paradoxosomatidae. She also thanks Dr. J.-J. GEOFFROY of M.N.H.N., Paris for his help in the presentation of the results during the 9th International Congress of Myriapodology, Paris, France, July 1993.

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